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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/870,327	05/30/2001	Yoshio Suzuki	450100-03198	7706

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EXAMINER

CHUNG, DAVID Y

ART UNIT PAPER NUMBER

2871

DATE MAILED: 05/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/870,327

Applicant(s)

SUZUKI ET AL.

Examiner

David Y. Chung

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☒ Claim(s) 16-20 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ 6) ☐ Other: ____

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claim 1-15 rejected under 35 U.S.C. 103(a) as being unpatentable over Mazaki et al. (U.S. 6,124,913) in further view of Tsujikawa et al. (U.S. 6,320,628) and Gunning et al. (EP 0622656).

As to claims 1, 5, 10 and 14, Mazaki et al. discloses in an OCB mode liquid crystal display having two compensators formed between the upper electrode substrate 3 and analyzer 10 on the light exit side of the display. See figure 10. Figures 4(h)-4(k) show various compensator arrangements for the liquid crystal display of figure 10, including those in which the optical phase difference caused by light entry side liquid crystal molecules is compensated by one of the two compensators.

Mazaki et al. does not disclose a microlens array for focusing incoming light onto the display pixels. Tsujikawa et al. teaches that combining a microlens array with a liquid crystal device in a projection display allows portions of blue, red, and green luminous fluxes to be selectively incident to the pixels of the LCD element, thereby

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eliminating the need for color filters and increasing the optical utilization efficiency of light. See column 3, lines 25-35. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to combine the device of Mazaki et al. with a microlens array in order to create a projection display with better light efficiency as taught by Tsujikawa et al.

As to claims 2-4, Mazaki et al. does not disclose forming the optical compensation film at an angle to the surface of the liquid crystal panel. Gunning et al. disclose various arrangements in figures 6-8 including one with the compensators disposed at an angle to the liquid crystal layer. Gunning et al. teaches that this arrangement, depicted in figure 8, allows the optical axis of the compensator layers to be substantially parallel to the average direction of the optical axis within the central, nominally homeotropic region of the liquid crystal layer in its driven state. An improvement in contrast is possible, allowing the display to be inverted, thereby benefiting from the inherently better grayscale performance in the lower quadrant of the display. See column 11, lines 10-35. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to tilt the compensators at an angle in order to improve contrast and grayscale performance.

As to claims 6-9, it was well known and obvious to perform computer simulations in order to find optimal values for the result effective variables of a liquid crystal device. These steps were necessary to optimize the performance of the device and were

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typically performed as part of the post manufacturing process. In the display of Mazaki et al., it would have been obvious to one of ordinary skill in the art at the time of invention to find appropriate values for the retardation and inclination angle of the compensators in order to optimize the contrast and viewing angle of the display.

As to claims 11 and 13, note the bend mode alignment shown in figure 10 of Mazaki et al. In the voltage applied state, the molecules are realigned such that the major axes change in position from one that is parallel to the substrates to a position perpendicular to the substrates as they are situated further from the light entry and light exit regions of the liquid crystal layer.

As to claim 12, note the two compensators shown in figure 10 of Mazaki et al. and the various arrangements shown in figure 4(h)-4(k). One compensator compensates for the phase difference caused by light entry side liquid crystal molecules, and the other compensates for the phase difference caused by light exit side liquid crystal molecules.

As to claim 15, note the crossed Nicols relationship of polarizer 5 and analyzer 1 in figure 10 of Mazaki et al.

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Allowabl Subject Matter

2. Claims 16-20 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: none of the prior art taught or suggested a liquid crystal device as recited in claim 10, further comprising a third optical phase compensator for compensating for an optical phase difference caused by liquid crystal molecules present in the middle of the liquid crystal layer away from the light entry side and light exit side.

Conclusion

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Chung whose telephone number is (703) 306-0155. The examiner can normally be reached on Monday-Friday from 8:30 am to 5:00 pm.

TOANTON
PRIMARY EXAMINER

David Chung
GAU 2871
05/04/03